



#6/Response
Abuel
6/22/00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

John Carroll

Filed: July 21, 1999

Serial No.: 09/358,206

For: HIGH EFFICIENCY PNEUMATICALLY
DRIVEN ELECTRIC POWER GENERATOR)

) Group Art Unit: 2834

) Examiner: Guillermo Perez

) Attorney Docket: WAB 97090

) Date: June 9, 2000

HON. COMMISSIONER OF PATENTS AND TRADEMARKS
WASHINGTON D.C. 20231

ATTN: BOX NON-FEE AMENDMENT

AMENDMENT

Sir:

Applicant is in receipt of an office action regarding this case which was mailed on March 10, 2000. In his actions, the examiner noted that the rejections presented in the action are based on new grounds of rejection. The examiner rejected claims 1, 2, 5-7, 11, 12 and 14-21. He stated:

"CLAIMS 1 TO 2, 5 TO 7, 11 TO 12, 14 TO 21 ARE REJECTED UNDER 35 U.S.C. 103(A) AS BEING UNPATENTABLE OVER LI (U.S. PAT. NO. 5,945,749) IN VIEW OF OUDET ET AL. (U.S. PAT. NO. 5,559,378) AND FURTHER IN VIEW OF CARROL (U.S. PAT. NO. 5,350,222).

LI DISCLOSES A PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR (FIGURE 1) COMPRISING: A CYLINDER (9); A PISTON (1) DISPOSED WITHIN SAID CYLINDER;

MEANS (4,6) ENGAGING SAID PISTON FOR BIASING SAID PISTON FROM A SECOND POSITION TOWARD A FIRST POSITION WHEREBY SAID PISTON OSCILLATES, MOVING BACK AND FORTH BETWEEN SAID FIRST POSITION AND SAID SECOND POSITION, DRIVEN BY AIR SUPPLIED THROUGH AN AIR SUPPLY PASSAGE (13) TO SAID CYLINDER; AND

AT LEAST ONE ELECTRIC COIL (7) PLACED TO ENCLOSE CHANGING MAGNETIC FLUX CAUSED BY SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON WHEREBY AN EMF IS GENERATED IN SAID ELECTRIC COIL, SO THAT AN EXTERNAL CIRCUIT CONNECTED TO SAID ELECTRIC COIL RECEIVES ELECTRIC POWER FROM SAID ELECTRIC COIL;

SAID MEANS ENGAGING SAID PISTON FOR BIASING SAID PISTON FROM SAID SECOND POSITION TOWARD SAID FIRST POSITION IS A COMPRESSION SPRING (4,6) DISPOSED BETWEEN A PISTON EXTENSION (14) AND AN END CLOSURE (11);

A CYLINDER EXTENSION (11) AT LEAST ONE OF FORMED INTEGRALLY WITH AND ATTACHED TO SAID CYLINDER, SAID CYLINDER EXTENSION HAVING AN INNER SURFACE HAVING A TRANSVERSE DIMENSION GREATER THAN A TRANSVERSE DIMENSION OF SAID CYLINDER, SAID CYLINDER EXTENSION HAVING AN END CLOSURE; AND

AN EXHAUST PASSAGE (13) CONNECTED TO AT LEAST ONE OF SAID CYLINDER EXTENSION AND SAID END CLOSURE;

A PISTON EXTENSION AT LEAST ONE OF FORMED INTEGRALLY WITH AND ATTACHED TO SAID PISTON, AT LEAST A PORTION OF SAID PISTON EXTENSION CONTACTING AT LEAST A PORTION OF SAID CYLINDER EXTENSION TO PROVIDE POSITIONAL CONSTRAINT TO SAID PISTON;

SAID PORTION OF SAID PISTON EXTENSION CONTACTING AT LEAST A PORTION OF SAID CYLINDER EXTENSION IS AN OUTER SURFACE OF SAID PISTON EXTENSION AND SAID PORTION OF SAID CYLINDER EXTENSION IS AN INNER SURFACE OF SAID CYLINDER EXTENSION;

SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON IS PROVIDED BY A MAGNET ATTACHED TO AT LEAST ONE OF SAID PISTON AND SAID PISTON EXTENSION;

SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON IS PROVIDED BY FORMING AT LEAST ONE OF SAID PISTON AND SAID PISTON EXTENSION OF A MATERIAL HAVING A MAGNETIC MOMENT. HOWEVER, LI DOES NOT DISCLOSE A CYLINDER HAVING A FIRST END CONNECTABLE THROUGH AN INLET FLOW PATH TO AN AIR SUPPLY PASSAGE CONTAINING AIR AT A POSITIVE PRESSURE, A SECOND END OF SAID CYLINDER BEING OPEN; NOR THAT

SAID PISTON IS ALSO POSITIONABLE IN A SECOND LOCATION WHEREIN SAID FIRST PORTION OF SAID PISTON IS OUTSIDE OF SAID CYLINDER SO THAT CLEARANCE IS PROVIDED BETWEEN SAID PISTON AND SAID CYLINDER SO THAT AIR MAY EXHAUST FROM SAID CYLINDER; NOR

A FIRST CYLINDER HAVING A FIRST END CONNECTABLE THROUGH A FIRST INLET FLOW PATH TO AN AIR SUPPLY PASSAGE, A SECOND END OF SAID FIRST CYLINDER BEING OPEN;

SECOND CYLINDER HAVING A FIRST END CONNECTABLE THROUGH A SECOND INLET FLOW PATH TO SAID AIR SUPPLY PASSAGE, A SECOND END OF SAID SECOND CYLINDER BEING OPEN;

A PISTON HAVING A MAGNETIC MOMENT ASSOCIATED THEREWITH, SAID PISTON HAVING A FIRST END PORTION AND A SECOND END PORTION, SAID PISTON BEING POSITIONABLE IN A FIRST LOCATION WHEREIN SAID FIRST END PORTION OF SAID PISTON IS DISPOSED WITHIN SAID FIRST CYLINDER AND SAID SECOND END PORTION OF SAID PISTON IS DISPOSED OUTSIDE OF SAID SECOND CYLINDER, SAID PISTON FURTHER BEING POSITIONABLE IN A SECOND LOCATION WHEREIN SAID SECOND END PORTION OF SAID PISTON IS DISPOSED WITHIN SAID SECOND CYLINDER AND SAID FIRST PORTION OF SAID PISTON IS OUTSIDE OF SAID FIRST CYLINDER;

SO THAT WHEN SAID PISTON IS DISPOSED IN SAID FIRST POSITION, AIR PRESSURE RECEIVED IN SAID FIRST CYLINDER THROUGH SAID FIRST INLET FLOW PATH DRIVES SAID PISTON TOWARD SAID SECOND POSITION, WHEREUPON SAID FIRST CYLINDER EXHAUSTS, AND WHEN SAID PISTON IS DISPOSED IN SAID SECOND POSITION, AIR PRESSURE RECEIVED IN SAID SECOND CYLINDER THROUGH SAID SECOND INLET FLOW PATH DRIVES SAID PISTON TOWARD SAID FIRST POSITION, WHEREUPON SAID SECOND CYLINDER EXHAUSTS, SO THAT SAID PISTON OSCILLATES; NOR

SEALING MEANS DISPOSED ON AT LEAST ONE OF AN OUTER SURFACE OF SAID FIRST PORTION OF SAID PISTON AND AN INNER SURFACE OF SAID CYLINDER TO PREVENT LOSS OF AIR BETWEEN SAID PISTON AND SAID CYLINDER AND PERMIT AIR PRESSURE IN SAID CYLINDER TO INCREASE WHEN SAID FIRST PORTION OF SAID PISTON IS DISPOSED WITHIN

SAID CYLINDER; NOR THAT SAID SEALING MEANS IS AN O-RING IN A GROOVE FORMED ON SAID OUTER SURFACE OF SAID FIRST PORTION OF SAID PISTON; NOR THAT SAID INLET FLOW PATH INCLUDES AN ELECTRICALLY ACTUATED SHUTOFF VALVE TO PREVENT AIR FLOW THROUGH SAID GENERATOR, THEREBY TURNING OFF SAID GENERATOR; NOR THAT SAID AT LEAST ONE ELECTRIC COIL IS CONNECTED TO A RECTIFIER TO SUPPLY DC ELECTRIC POWER; NOR THAT SAID RECTIFIER IS A FULL BRIDGE RECTIFIER TO SUPPLY DC ELECTRIC POWER WHENEVER A NET FLUX THROUGH SAID AT LEAST ONE ELECTRIC COIL IS CHANGING.

OUDET ET AL. DISCLOSE A PNEUMATIC DEVICE (FIGURE 5) COMPRISING:

A CYLINDER (70) HAVING A FIRST END (75) CONNECTABLE THROUGH AN INLET FLOW PATH (80) TO AN AIR SUPPLY PASSAGE CONTAINING AIR AT A POSITIVE PRESSURE, A SECOND END OF SAID CYLINDER BEING OPEN (91, 93);

A PISTON (56) HAVING A MAGNETIC MOMENT ASSOCIATED THEREWITH, SAID PISTON BEING POSITIONABLE IN A FIRST LOCATION WHEREIN AT LEAST A FIRST PORTION OF SAID PISTON IS DISPOSED WITHIN SAID CYLINDER;

SAID PISTON ALSO BEING POSITIONABLE IN A SECOND LOCATION WHEREIN SAID FIRST PORTION OF SAID PISTON IS OUTSIDE OF SAID CYLINDER SO THAT CLEARANCE IS PROVIDED BETWEEN SAID PISTON AND SAID CYLINDER SO THAT AIR MAY EXHAUST FROM SAID CYLINDER (COLUMN 8, LINES 48 TO 58);

MEANS (52) ENGAGING SAID PISTON FOR BIASING SAID PISTON FROM SAID SECOND POSITION TOWARD SAID FIRST POSITION SO THAT AFTER SAID CYLINDER HAS SUBSTANTIALLY EXHAUSTED, SAID PISTON MOVES TO SAID FIRST POSITION, WHEREBY SAID PISTON OSCILLATES, MOVING BACK AND FORTH BETWEEN SAID FIRST POSITION AND SAID SECOND POSITION, DRIVEN BY AIR SUPPLIED THROUGH SUCH AIR SUPPLY PASSAGE TO SAID CYLINDER; AND

AT LEAST ONE ELECTRIC COIL (100) PLACED TO ENCLOSE CHANGING MAGNETIC FLUX CAUSED BY SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON WHEREBY AN EMF IS

GENERATED IN SAID ELECTRIC COIL, SO THAT AN EXTERNAL CIRCUIT CONNECTED TO SAID ELECTRIC COIL RECEIVES ELECTRIC POWER FROM SAID ELECTRIC COIL;

SAID MEANS ENGAGING SAID PISTON FOR BIASING SAID PISTON FROM SAID SECOND POSITION TO SAID FIRST POSITION IS A SPRING (52);

FIRST CYLINDER (70) HAVING A FIRST END (75) CONNECTABLE THROUGH A FIRST INLET FLOW PATH (80) TO AN AIR SUPPLY PASSAGE, A SECOND END OF SAID FIRST CYLINDER BEING OPEN (91, 93);

SECOND CYLINDER (71) HAVING A FIRST END (76) CONNECTABLE THROUGH A SECOND INLET FLOWPATH (82) TO SAID AIR SUPPLY PASSAGE, A SECOND END OF SAID SECOND CYLINDER BEING OPEN (90, 92);

A PISTON (56) HAVING A MAGNETIC MOMENT ASSOCIATED THEREWITH, SAID PISTON HAVING A FIRST END PORTION AND A SECOND END PORTION, SAID PISTON BEING POSITIONABLE IN A FIRST LOCATION WHEREIN SAID FIRST END PORTION OF SAID PISTON IS DISPOSED WITHIN SAID FIRST CYLINDER AND SAID SECOND END PORTION OF SAID PISTON IS DISPOSED OUTSIDE OF SAID SECOND CYLINDER, SAID PISTON FURTHER BEING POSITIONABLE IN A SECOND LOCATION WHEREIN SAID SECOND END PORTION OF SAID PISTON IS DISPOSED WITHIN SAID SECOND CYLINDER AND SAID FIRST PORTION OF SAID PISTON IS OUTSIDE OF SAID FIRST CYLINDER;

SO THAT WHEN SAID PISTON IS DISPOSED IN SAID FIRST POSITION, AIR PRESSURE RECEIVED IN SAID FIRST CYLINDER THROUGH SAID FIRST INLET FLOWPATH DRIVES SAID PISTON TOWARD SAID SECOND POSITION, WHEREUPON SAID FIRST CYLINDER EXHAUSTS, AND WHEN SAID PISTON IS DISPOSED IN SAID SECOND POSITION, AIR PRESSURE RECEIVED IN SAID SECOND CYLINDER THROUGH SAID SECOND INLET FLOWPATH DRIVES SAID PISTON TOWARD SAID FIRST POSITION, WHEREUPON SAID SECOND CYLINDER EXHAUSTS, SO THAT SAID PISTON OSCILLATES (COLUMN 8, LINES 48 TO 58); AND

AT LEAST ONE ELECTRIC COIL (100, 101) PLACED TO ENCLOSE CHANGING MAGNETIC FLUX CAUSED BY SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON WHEREBY AN EMF

IS GENERATED IN SAID ELECTRIC COIL, SO THAT AN EXTERNAL CIRCUIT CONNECTED TO SAID ELECTRIC COIL RECEIVES ELECTRIC POWER FROM SAID ELECTRIC COIL;

SAID ACTUATOR FURTHER INCLUDES A SPRING (51, 52) ENGAGING SAID PISTON TO BIAS SAID PISTON TOWARD ONE OF SAID FIRST POSITION AND SAID SECOND POSITION TO FACILITATE STARTING SAID GENERATOR WHEN AIR IS SUPPLIED THROUGH SAID FIRST AIR SUPPLY PASSAGE AND SAID SECOND AIR SUPPLY PASSAGE FOR THE PURPOSE OF GENERATING A FORCE BY MEANS OF SIGNIFICANT APPLIED ELECTRIC POWER AND HAVING OPTIMAL SPACE REQUIREMENTS.

CARROLL DISCLOSES SEALING MEANS (79, 80) DISPOSED ON AT LEAST ONE OF AN OUTER SURFACE OF SAID FIRST PORTION OF SAID PISTON (70) AND AN INNER SURFACE (65) OF SAID CYLINDER; AND THAT SAID SEALING MEANS IS AN O-RING INSERTED IN A GROOVE FORMED ON SAID OUTER SURFACE OF SAID FIRST PORTION OF SAID PISTON FOR THE PURPOSE OF AVOIDING ESCAPE OF AIR BETWEEN THE PISTON AND THE CYLINDER.

IT WOULD HAVE BEEN OBVIOUS AT THE TIME THE INVENTION WAS MADE TO MODIFY THE ELECTROMAGNETIC ACTUATOR OF LI AND PROVIDE IT WITH A CYLINDER HAVING A FIRST END CONNECTABLE THROUGH AN INLET FLOW PATH TO AN AIR SUPPLY PASSAGE CONTAINING AIR AT A POSITIVE PRESSURE, A SECOND END OF SAID CYLINDER BEING OPEN; AND A PISTON HAVING A MAGNETIC MOMENT ASSOCIATED THEREWITH, SAID PISTON BEING POSITIONABLE IN A FIRST LOCATION WHEREIN AT LEAST A FIRST PORTION OF SAID PISTON IS DISPOSED WITHIN SAID CYLINDER; AND SAID PISTON ALSO BEING POSITIONABLE IN A SECOND LOCATION WHEREIN SAID FIRST PORTION OF SAID PISTON IS OUTSIDE OF SAID CYLINDER SO THAT CLEARANCE IS PROVIDED BETWEEN SAID PISTON AND SAID CYLINDER SO THAT AIR MAY EXHAUST FROM SAID CYLINDER; AND MEANS ENGAGING SAID PISTON FOR BIASING SAID PISTON FROM SAID SECOND POSITION TOWARD SAID FIRST POSITION SO THAT AFTER SAID CYLINDER HAS SUBSTANTIALLY EXHAUSTED, SAID PISTON MOVES TO SAID FIRST POSITION, WHEREBY SAID PISTON OSCILLATES, MOVING BACK AND FORTH BETWEEN SAID FIRST POSITION AND SAID SECOND POSITION, DRIVEN BY AIR SUPPLIED THROUGH SUCH AIR SUPPLY PASSAGE TO SAID CYLINDER; AND AT LEAST ONE ELECTRIC COIL PLACED TO

ENCLOSE CHANGING MAGNETIC FLUX CAUSED BY SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON WHEREBY AN EMF IS GENERATED IN SAID ELECTRIC COIL, SO THAT AN EXTERNAL CIRCUIT CONNECTED TO SAID ELECTRIC COIL RECEIVES ELECTRIC POWER FROM SAID ELECTRIC COIL; IN WHICH SAID MEANS ENGAGING SAID PISTON FOR BIASING SAID PISTON FROM SAID SECOND POSITION TO SAID FIRST POSITION IS A SPRING; AND A FIRST CYLINDER HAVING A FIRST END CONNECTABLE THROUGH A FIRST INLET FLOW PATH TO AN AIR SUPPLY PASSAGE, A SECOND END OF SAID FIRST CYLINDER BEING OPEN; AND A SECOND CYLINDER HAVING A FIRST END CONNECTABLE THROUGH A SECOND INLET FLOW PATH TO SAID AIR SUPPLY PASSAGE, A SECOND END OF SAID SECOND CYLINDER BEING OPEN; AND A PISTON HAVING A MAGNETIC MOMENT ASSOCIATED THEREWITH, SAID PISTON HAVING A FIRST END PORTION AND A SECOND END PORTION, SAID PISTON BEING POSITIONABLE IN A FIRST LOCATION WHEREIN SAID FIRST END PORTION OF SAID PISTON IS DISPOSED WITHIN SAID FIRST CYLINDER AND SAID SECOND END PORTION OF SAID PISTON IS DISPOSED OUTSIDE OF SAID SECOND CYLINDER, SAID PISTON FURTHER BEING POSITIONABLE IN A SECOND LOCATION WHEREIN SAID SECOND END PORTION OF SAID PISTON IS DISPOSED WITHIN SAID SECOND CYLINDER AND SAID FIRST PORTION OF SAID PISTON IS OUTSIDE OF SAID FIRST CYLINDER; SO THAT WHEN SAID PISTON IS DISPOSED IN SAID FIRST POSITION, AIR PRESSURE RECEIVED IN SAID FIRST CYLINDER THROUGH SAID FIRST INLET FLOW PATH DRIVES SAID PISTON TOWARD SAID SECOND POSITION, WHEREUPON SAID FIRST CYLINDER EXHAUSTS, AND WHEN SAID PISTON IS DISPOSED IN SAID SECOND POSITION, AIR PRESSURE RECEIVED IN SAID SECOND CYLINDER THROUGH SAID SECOND INLET FLOW PATH DRIVES SAID PISTON TOWARD SAID FIRST POSITION, WHEREUPON SAID SECOND CYLINDER EXHAUSTS, SO THAT SAID PISTON OSCILLATES; AND AT LEAST ONE ELECTRIC COIL PLACED TO ENCLOSE CHANGING MAGNETIC FLUX CAUSED BY SAID MAGNETIC MOMENT ASSOCIATED WITH SAID PISTON WHEREBY AN EMF IS GENERATED IN SAID ELECTRIC COIL, SO THAT AN EXTERNAL CIRCUIT CONNECTED TO SAID ELECTRIC COIL RECEIVES ELECTRIC POWER FROM SAID ELECTRIC COIL; AND SAID ACTUATOR FURTHER INCLUDES A SPRING ENGAGING SAID PISTON TO BIAS SAID PISTON TOWARD ONE OF SAID FIRST POSITION AND SAID SECOND POSITION TO FACILITATE

STARTING SAID GENERATOR WHEN AIR IS SUPPLIED THROUGH SAID FIRST AIR SUPPLY PASSAGE AND SAID SECOND AIR SUPPLY PASSAGE AS DISCLOSED BY OUDET ET AL.; AND WITH SEALING MEANS DISPOSED ON AT LEAST ONE OF AN OUTER SURFACE OF SAID FIRST PORTION OF SAID PISTON AND AN INNER SURFACE OF SAID CYLINDER; IN WHICH SAID SEALING MEANS IN AN O-RING INSERTED IN A GROOVE FORMED ON SAID OUTER SAID OUTER SURFACE OF SAID FIRST PORTION OF SAID PISTON AS DISCLOSED BY CARROLL, FOR THE PURPOSE OF HAVING OPTIMAL SPACE REQUIREMENTS AND AVOIDING ESCAPE OF AIR BETWEEN THE PISTON AND THE CYLINDER.

IT WOULD HAVE BEEN OBVIOUS TO ONE HAVING ORDINARY SKILL IN THE ART AT THE TIME THE INVENTION WAS MADE TO SUBSTITUTE THE PISTON TYPE CONTROL VALVE DISCLOSED BY LI WITH AN ELECTRIC ACTUATED SHUTOFF VALVE, SINCE THE EXAMINER TAKES OFFICIAL NOTICE OF THE EQUIVALENCE OF THE ELECTRIC ACTUATED SHUTOFF VALVE AND THE PISTON TYPE CONTROL VALVE FOR THEIR USE IN THE ELECTRIC GENERATOR STRUCTURE ART AND THE SELECTION OF ANY OF THESE KNOWN EQUIVALENTS TO PREVENT AIR FLOW THROUGH SAID GENERATOR WOULD BE WITHIN THE LEVEL OF ORDINARY SKILL IN THE ART.

IT WOULD HAVE BEEN OBVIOUS TO ONE HAVING ORDINARY SKILL IN THE ART AT THE TIME THE INVENTION WAS MADE TO CONNECT THE ELECTRIC COIL TO A FULL BRIDGE RECTIFIER SINCE IT WAS KNOWN IN THE ART THAT THE FULL BRIDGE RECTIFIER IS USED TO SUPPLY DC ELECTRIC POWER WHENEVER A NET FLUX THROUGH THE COILS IS CHANGING."

Agent for the applicant notes that the patent of Oudet, 5,559,378, teaches an electromagnetic actuator or valve. The devices shown in figures 1 to 4, basically, are solenoids. Figure 5 of that patent, which the examiner cited, is an electromagnetic valve. The device illustrated in Figure 5 is controlled by electricity which provides energy to position a moveable device 50 to connect or disconnect pressure inlets 80 and 82 to pressure outlets 81 and 83.

The electromagnetic valve of Oudet does not convert energy from pneumatic to electrical nor from electrical to pneumatic. It is not an energy conversion device. It does not convert energy from any form to any other form. The electrical energy which it employs is not converted to any other form of energy, it is used only for control. It is employed only to connect or disconnect the fluid pressure from inlets 80 and 82 to outlets 81 and 83.

Accordingly, agent for the applicant believes that Oudet teaches non-analogous art. It is believed that a person skilled in the electrical generator art would not ordinarily be skilled in the design of fluid control valves. Accordingly, it is believed that the examiner's rejections of claims 1, 2, 5-7, 11, 12 and 14-21 under 35 U.S.C. § 103(a) due to Li, Oudet and Carroll have been overcome, and the examiner is respectfully requested to withdraw his rejections of claims 1, 2, 5-7, 11, 12 and 14-21 under 35 U.S.C. § 103(a) due to Li, Oudet and Carroll.

In regard to claim 3, the examiner stated:

"CLAIM 3 IS REJECTED UNDER 35 U.S.C. 103(A) AS BEING UNPATENTABLE OVER LI IN VIEW OF OUDET ET AL. AND FURTHER OF CARROL IN VIEW OF FIEGEL ET AL. (U.S. PAT. NO. 5,826,952).

LI, OUDET ET AL. AND CARROL DISCLOSE A PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR AS DESCRIBED ON ITEM 1 ABOVE. HOWEVER, NEITHER LI, OUDET ET AL. NOR CARROL DISCLOSE THAT SAID INLET FLOW PATH INCLUDES AN AIR FILTER FOR EXCLUDING FOREIGN MATERIAL FROM SAID CYLINDER.

FEIGEL ET AL. DISCLOSE THAT SAID INLET FLOW PATH INCLUDES AN AIR FILTER (62) TO EXCLUDE FOREIGN MATERIAL FROM SAID CYLINDER FOR THE PURPOSE OF PREVENT THE INGRESS OF DIRT PARTICLES.

IT WOULD HAVE BEEN OBVIOUS AT THE TIME THE INVENTION WAS MADE TO MODIFY THE PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR OF LI, OUDET ET AL. AND CARROL AND PROVIDE IT WITH AN INLET FLOW PATH INCLUDING AN AIR FILTER FOR THE PURPOSE OF EXCLUDING FOREIGN MATERIAL FROM SAID CYLINDER."

As discussed previously, Oudet is believed to be non-analogous art and therefore not relevant to patentability under 35 U.S.C. § 103(a). Accordingly, the examiner is respectfully requested to withdraw his rejection of claim 3 due to Li, Oudet, Carroll and Fiegel.

In regard to claim 4, the examiner stated:

"CLAIM 4 IS REJECTED UNDER 35 U.S.C. 103(A) AS BEING UNPATENTABLE OVER LI IN VIEW OF OUDET ET AL. AND FURTHER OF CARROL IN VIEW OF NOLTNER (DE 2355728A).

LI, OUDET ET AL. AND CARROL DISCLOSE A PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR AS DESCRIBED ON ITEM 1 ABOVE. HOWEVER, NEITHER LI, OUDET ET AL. NOR CARROL DISCLOSE THAT SAID INLET FLOW PATH INCLUDES A CHOKE TO CONTROL AN IMPEDANCE OF SAID INLET FLOW PATH.

NOLTNER DISCLOSES THAT SAID INLET FLOW PATH INCLUDES A CHOKE (11 AND 10) FOR THE PURPOSE OF CONTROLLING AN IMPEDANCE OF SAID INLET FLOW PATH.

IT WOULD HAVE BEEN OBVIOUS AT THE TIME THE INVENTION WAS MADE TO MODIFY THE PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR OF LI, OUDET ET AL. AND CARROL AND PROVIDE IT WITH AN INLET FLOW PATH INCLUDING A CHOKE FOR THE PURPOSE OF CONTROLLING AN IMPEDANCE OF SAID INLET FLOW PATH."

As noted supra, Oudet is believed to be non-analogous art and therefore not relevant to patentability under 35 U.S.C. § 103(a). Accordingly, the examiner is respectfully requested to withdraw his rejection of claim 4 due to Li, Oudet, Carroll and Nolter.

In regard to claim 8, the examiner stated:

"CLAIM 8 IS REJECTED UNDER 35 U.S.C. 103 (A) AS BEING UNPATENTABLE OVER LI IN VIEW OF OUDET ET AL. AND FURTHER OF CARROL IN VIEW OF DUNNE ET AL. (U.S. PAT. No. 3,661,051).

LI, OUDET ET AL. AND CARROL DISCLOSE A PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR AS DESCRIBED ON ITEM 1 ABOVE. HOWEVER, NEITHER LI, OUDET ET AL. NOR CARROL DISCLOSE THAT AT LEAST ONE OF SAID OUTER SURFACE OF SAID PISTON EXTENSION AND SAID INNER SURFACE OF SAID CYLINDER EXTENSION IS AT LEAST ONE OF MADE FROM AND COATED WITH A LOW FRICTION MATERIAL.

DUNNE ET AL. DISCLOSE THAT AT LEAST ONE OF SAID OUTER SURFACE OF SAID PISTON EXTENSION AND SAID INNER SURFACE OF SAID CYLINDER EXTENSION IS AT LEAST ONE OF MADE FROM AND COATED WITH A LOW FRICTION MATERIAL (COLUMN 4, LINES 46 TO 57) FOR THE PURPOSE OF REDUCING WEAR ON THE PISTONS.

IT WOULD HAVE BEEN OBVIOUS AT THE TIME THE INVENTION WAS MADE TO MODIFY THE PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR OF LI, OUDET ET AL. AND CARROL AND PROVIDE IT WITH AT LEAST ONE OF SAID OUTER SURFACE OF SAID PISTON EXTENSION AND SAID INNER SURFACE OF SAID CYLINDER EXTENSION MADE FROM AND COATED WITH A LOW FRICTION MATERIAL AS DISCLOSED BY DUNNE ET AL. FOR THE PURPOSE OF REDUCING THE WEAR ON THE PISTONS SURFACE DURING OPERATION."

As noted supra, Oudet is believed to be non-analogous art and therefore not relevant to patentability under 35 U.S.C. § 103(a). Accordingly, the examiner is respectfully requested to withdraw his rejection of claim 8 due to Li, Oudet, Carroll and Dunne.

In regard to claim 13, the examiner stated:

"CLAIM 13 IS REJECTED UNDER 35 U.S.C. 103(A) AS BEING UNPATENTABLE OVER LI IN VIEW OF OUDET ET AL. AND FURTHER OF CARROL IN VIEW OF BALL ET AL. (U.S. PAT. No. 5,890,460).

LI, OUDET ET AL. AND CARROL DISCLOSE A PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR AS DESCRIBED ON ITEM 1 ABOVE. HOWEVER, NEITHER LI, OUDET ET AL. NOR CARROL DISCLOSE THAT SAID EXHAUST PASSAGE INCLUDES A MUFFLER TO REDUCE NOISE RELEASED FROM SAID GENERATOR.

BALL ET AL. DISCLOSE THAT SAID EXHAUST PASSAGE INCLUDES A MUFFLER TO REDUCE NOISE RELEASED FROM SAID GENERATOR (1178) FOR THE PURPOSE OF REDUCING NOISE EMITTED BY THE ENGINE AND THE GENERATOR.

IT WOULD HAVE BEEN OBVIOUS AT THE TIME THE INVENTION WAS MADE TO MODIFY THE PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR OF LI, OUDET ET AL. AND CARROL AND PROVIDE IT WITH AN SAID EXHAUST PASSAGE INCLUDING A MUFFLER FOR THE PURPOSE OF REDUCING NOISE RELEASED FROM SAID GENERATOR."

As stated earlier, Oudet is believed to be non-analogous art and therefore not relevant to patentability under 35 U.S.C. § 103(a). Accordingly, the examiner is respectfully requested to withdraw his rejection of claim 13 due to Li, Oudet, Carroll and Ball.

In regard to claims 9 and 10, the examiner stated:

"CLAIMS 9 TO 10 ARE REJECTED UNDER 35 U.S.C. 103(A) AS BEING UNPATENTABLE OVER LI IN VIEW OF OUDET ET AL. AND FURTHER OF CARROL IN VIEW OF YOUNG (U.S. PAT. No. 4,697,113).

LI, OUDET ET AL. AND CARROL DISCLOSE A PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR AS DESCRIBED ON ITEM 1 ABOVE. HOWEVER, NEITHER LI, OUDET ET AL. NOR CARROL DISCLOSE THAT SAID PISTON EXTENSION HAS AT LEAST ONE LONGITUDINAL AIR PASSAGE TO CARRY AIR TO AN END OF SAID PISTON ADJACENT SAID END CLOSURE, SAID EXHAUST BEING CONNECTED TO SAID END CLOSURE; NOR THAT SAID AT LEAST ONE LONGITUDINAL AIR PASSAGE IS A LONGITUDINAL SLOT FORMED IN SAID OUTER SURFACE OF SAID PISTON EXTENSION.

YOUNG DISCLOSES THAT SAID PISTON EXTENSION (17) HAS AT LEAST ONE LONGITUDINAL AIR PASSAGE (COLUMN 5, LINES 3 TO 9) TO CARRY AIR TO AN END OF SAID PISTON ADJACENT SAID END CLOSURE, SAID EXHAUST BEING CONNECTED TO SAID END CLOSURE; AND THAT SAID AT LEAST ONE LONGITUDINAL AIR PASSAGE IS A LONGITUDINAL SLOT FORMED IN SAID OUTER SURFACE OF SAID PISTON EXTENSION FOR THE PURPOSE OF KEEPING EQUAL PRESSURE BETWEEN TWO DIFFERENT SPACES.

IT WOULD HAVE BEEN OBVIOUS AT THE TIME THE INVENTION WAS MADE TO MODIFY THE PNEUMATICALLY DRIVEN ELECTRIC POWER GENERATOR OF LI, OUDET ET AL. AND CARROL AND PROVIDE IT WITH A PISTON EXTENSION HAVING AT LEAST ONE LONGITUDINAL AIR PASSAGE TO CARRY AIR TO AN END OF SAID PISTON ADJACENT SAID END CLOSURE, SAID EXHAUST BEING CONNECTED TO SAID END CLOSURE; IN WHICH SAID AT LEAST ONE LONGITUDINAL AIR PASSAGE BEING LONGITUDINAL SLOT FORMED IN SAID OUTER SURFACE OF SAID PISTON EXTENSION AS DISCLOSED BY YOUNG, FOR THE PURPOSE OF KEEPING EQUAL PRESSURES BETWEEN TWO DIFFERENT SPACES."

As noted supra, Oudet is believed to be non-analogous art and therefore not relevant to patentability under 35 U.S.C. § 103(a). Accordingly, the examiner is respectfully requested to withdraw his rejection of claim 13 due to Li, Oudet, Carroll and Young.

Accordingly, it is believed that the application is now in condition for allowance. An early notice of allowance is respectfully requested.

In the event the examiner has further difficulties with the allowance of the application, he is invited to contact the undersigned agent for the applicants by telephone at (412)380-0725, to resolve any remaining questions or issues by interview and/or Examiner's Amendment as to any matter that will expedite the completion of the prosecution of the application.

Respectfully submitted,

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